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Ethics and Eating Fishes

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The oceans and seas of the world provide 168 times the volume of living space that is provided by terrestrial ecosystems.[1] This makes it tempting to conclude that there are "plenty of fish in the sea." Indeed, we have tended to behave as if the oceans hold an unlimited amount of sea life, and we continue to consume as if no amount of fishing or eating of sea life will harm ocean ecosystems. Moreover, while animal agriculture comes increasingly under fire for environmental damage and cruelty, the environmental degradation and the sufferings of fishes tend to swim under the radar.

As information and moral deliberation lead many informed people away from the consumption of farmed and hunted animals, dairy, and eggs—on behalf of the environment and because of unconscionable suffering of animals—some people shy away from a vegan diet, eschewing all flesh except that of sea life. This article explores fisheries, fishes, and foundational moral theories to critically analyze whether or not piscatorial leanings are a reasoned and informed choice for environmentalists or those who are otherwise concerned about making choices in the supermarket or in restaurants that cause unnecessary suffering.

1. Industrialized fishing[2]

Fish intake increased worldwide across the last century, largely because of human population growth combined with heightened concern about environmental effects of industrial animal agriculture and health risks entailed in consuming land animals, and because of misinformation about the safety of eating fishes. In fact, if present trends hold in the United States, fish consumption will outpace beef and poultry consumption in the very near future.[3]

Commercial fishing has already done serious damage to ocean ecosystems. Populations of predatory fishes, such as tunas, sharks, and marlins, have dropped 90%

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[1] M.R. Clark et al., *Seamounts, Deep-Sea Corals, and Fisheries: Vulnerability of Deep-sea Corals to Fishing on Seamounts Beyond Areas of National Jurisdiction* 5, UNITED NATIONS ENVIRONMENT PROGRAMME WORLD CONSERVATION MONITORING CENTRE (2006), *available at* http://www.unep.org/regionalseas/publications/reports/RSRS/pdfs/rsrs183.pdf; Alex Rogers, *The Last Frontier Is Blue*, 28 OXFORD TODAY: U. MAG., no.1, at 38–41 (2015).

[2] For more on diet and environment, *see* LISA KEMMERER, EATING EARTH: ENVIRONMENTAL ETHICS AND DIETARY CHOICE (2014).

[3] Howard M. Johnson, *U.S. Seafood Market in 2020 Strong Demand Likely Boon to Aquaculture*, GLOBAL AQUACULTURE ADVOCATE, October 2003, http://pdf.gaalliance.org/pdf/GAA-Johnson-Oct03.pdf.

since the introduction of industrial fishing.[4] Many fish species are currently at risk from overfishing, including red snapper, swordfish, sharks, flounders, soles, Chilean sea bass, blue and white marlins, Pacific salmon, smelt, rockfish, herring, groupers, and critically endangered bluefin tunas.[5] With regard to sharks, a 40-year study showed declines of 87 percent in sandbar sharks, 93 percent in blacktip sharks, 97 percent in tiger sharks, 98 percent in scalloped hammerheads, and 99 percent or more for bull, dusky, and smooth hammerhead sharks.[6] The longest-running survey of sharks, "conducted annually since 1972 off North Carolina, demonstrates sufficiently large declines in great sharks to imply their likely functional elimination."[7] The effects of these losses are already evident, including a marked increase in the great shark's primary prey species, particularly the cownose ray. And as might be expected, the "[e]ffects of this community restructuring have cascaded downward from the cownose ray," which feeds largely on scallops, terminating "a century-long scallop fishery."[8]

As some fish populations decline or even disappear, those who fish have simply moved deeper into the oceans.[9] For example, when fishing productivity on the continental shelf declined, fishers moved to deeper waters, pulling up a "hitherto-unexploited wealth of strange-looking fish on the slopes of the continental shelves, [even] down to 1600 metres."[10] The impact of industrial-scale fishing appears to be especially problematic for deep-sea fish. Thus at least five species of deep-water exotic fishes—roundnoses and onion-eye grenadiers, Greenland halibuts, blue hakes, spiny eels, and spinytail skates—"only caught since the 1970s—are now on the critically endangered list."[11] A longitudinal study of five species of deep-water fishes across 17 years revealed 87–98 percent population declines.[12]

There is no shortage of evidence that industrialized fishing has created an environmental crisis in ocean ecosystems around the world. We destroy roughly "100 million tons [91 million metric tons] of [marine] wildlife annually."[13] The Pew Oceans Commission has warned that the world's oceans are in a state of "silent collapse"—that our fishing has seriously damaged ocean ecosystems even to the point of no return.[14] Northwest salmon are now at a tiny fraction of their historic levels and have been for some time.[15] "A 1991 report by the American Fisheries Society

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[4] Ransom A. Myers & Boris Worm, *Rapid Worldwide Depletion of Predatory Fish Communities*, 423 NATURE 280 (2003).

[5] RAFT Consortium, *Seafood Traditions at Risk in North America*, http://www.albc-usa.org/RAFT/images/Resources/SeafoodTraditions.pdf (last visited June 17, 2016).

[6] Ransom A. Myers et al., *Cascading Effects of the Loss of Apex Predatory Sharks from a Coastal Ocean*, 315 SCIENCE 1846, 1848 (2007).

[7] *Id.* at 1847.

[8] *Id.* at 1846.

[9] Rogers, *supra* note 1.

[10] Debora MacKenzie, *Deep-sea Fish Species Decimated in a Generation*, NEWSCIENTIST: HEALTH, January 4, 2006, https://www.newscientist.com/article/dn8533-deep-sea-fish-species-decimated-in-a-generation/.

[11] *Id.*

[12] Jennifer A. Devine, Krista D. Baker, & Richard L. Haedrich, *Deep-Sea Fishes Qualify as Endangered*, 439 NATURE 29 (2006).

[13] *A Look at the Biggest Challenges—and the Way Forward*, MONTEREY BAY AQUARIUM (December 27, 2011), http://www.montereybayaquarium.org/cr/cr_seafoodwatch/issues/.

[14] *Id.*

[15] *Salmon Recovery*, NOAA FISHERIES, http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/ (last visited June 17, 2016).

indicated that 214 of about 400 stocks of salmon, steelhead, and sea-run cutthroat trout in the Northwest and California are at risk of extinction. The report also indicated that 106 are already extinct."[16] Simply put, our taste for fish is decimating fish populations, which cannot but damage ecosystems.[17]

Fishes are sold by weight, and larger fishes yield larger profits, so those who kill fishes tend to target large species, such as swordfishes and tunas. But larger fishes take longer to reach sexual maturity. An orange roughy, for example, reaches maturity at 40 and lives, on average, more than 150 years.[18] Consequently, though they have been fished commercially only since the 1970s (after easier-to-reach species were depleted), orange roughy populations have already declined precipitously in waters off Australia, New Zealand, and Namibia.[19] It is virtually impossible to target such large, slow-to-reproduce fishes in a sustainable manner, yet these are now the fishes of choice.[20]

Our seemingly unquenchable appetite for fishes is now shaping evolution. Because larger fishes are our preferred targets, fishing has reduced these populations in relation to smaller fish populations, destabilizing ecosystems and causing a general decline that disproportionally affects fishes with slower maturity rates.[21] Furthermore, because we target larger fishes, some larger populations now reach reproductive maturity earlier. The "process of maturing at younger ages and smaller sizes, called juvenescence, is usually a compensatory response to diminishing numbers within a population."[22] In a heavily fished area on the coast of Alabama, for example, red snapper now mature at two years of age and about 13 inches. A few hundred miles away, off the coast of Louisiana, red snapper mature at six years of age and about 27 inches.[23] Apparently, the only way larger fishes can survive long enough to reproduce is to reach sexual maturity at a younger age, when they are smaller. But, of course, this reduces the overall size of the fish population, a change that may be irreversible.[24]

Juvenescence is also affecting one of the largest fishes, bluefin tuna,[25] which sometimes reach 10 feet (more than 3 meters) and 1,500 pounds (679 kilograms), average 6.5 feet (2 meters), and weigh around 550 pounds (250 kilograms).[26] Bluefin tuna are also among the fastest of fishes, "shooting through the water with their

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[16] *Pacific Salmon (Oncorhynchus spp.)*, U.S. FISH & WILDLIFE SERV., http://www.fws.gov/species/species_accounts/bio_salm.html (last visited June 13, 2016).

[17] David Lawlor, *Preserving our Natural Heritage: The Fish of Earthjustice*, IN BRIEF, Winter 2010/2011, at 13.

[18] Rogers, *supra* note 1, at 39.

[19] *Rough Going for the Orange Roughy*, SMITHSONIAN NAT'L. MUSEUM OF NATURAL HIST., http://ocean.si.edu/ocean-news/rough-going-orange-roughy (last visited June 13, 2016).

[20] Janet Raloff, *Empty Nets*, 167 SCIENCE NEWS 360 (2005).

[21] Nils C. Stenseth & Tristan Rouyer, *Ecology: Destabilized Fish Stocks*, 452 NATURE 825 (2008).

[22] *Louisiana Fisheries*, LOUISIANA ST. U., http://www.seagrantfish.lsu.edu/faqs/redsnapper/biology.htm (last visited June 13, 2016).

[23] *Id.*

[24] Stenseth & Rouyer, *supra* note 21, at 826.

[25] NAT'L MARINE FISHERIES SERV., STATUS REVIEW REPORT FOR ATLANTIC BLUEFIN TUNA (THUNNUS THYNNUS) (2013), http://www.nmfs.noaa.gov/stories/2011/05/docs/bft_srr_final.pdf.

[26] *Atlantic Bluefin Tuna*, NATIONAL GEOGRAPHIC, http://animals.nationalgeographic.com/animals/fish/bluefin-tuna/ (last visited June 13, 2016).

powerful, crescent-shaped tails up to 43 miles [70 kilometers] per hour."[27] They are warm-blooded, "a rare trait among fish," and are also "among the most ambitiously migratory of all fish"—sometimes "swimming from North American to European waters several times a year."[28] These extraordinary fishes are "plundered by fishing vessels" as they travel to the Gulf of Mexico to spawn, and when they arrive they are "decimated by longline fishing boats [that are actually] seeking other species."[29] With soaring prices and an increase in demand, "bluefin stocks, especially of large, breeding-age fish, have plummeted."[30] Bluefin tuna are "at risk of collapse (90 percent decline in adult biomass within three generations, which is the criterion used by IUCN for defining populations as *Critically Endangered*), even under the currently agreed recovery plan," which was set in place in the hope of saving this species.[31] Their endangered status is not protecting these beautiful fish from being targeted, but it is reflected in their soaring price per pound. In January 2013, a single 444-pound (201-kilogram) bluefin tuna sold at auction for 1.78 million U.S. dollars in Tokyo's Tsukiji fish market—more than 4,000 dollars per pound, 20 times the current price of silver.[32] And our appetite for fish continues to grow along with our population, spurring on the world's fishing fleets.[33] If we continue on this path, predictions indicate that "all commercial fish and seafood species will collapse by 2048."[34]

2. Fishing methods

Because fishing methods are indiscriminate, fishers pull up tons of bycatch. Bycatch raises another set of moral concerns.

2.1. Bycatch

Bycatch (or bykill), often referred to as "trash," consists of sea animals that fishers pull up incidentally and then discard because they seek more profitable species. Along with unwanted fishes, nets and hooks commonly pull in birds, whales, seals, sea lions, porpoises, and sea turtles: "global marine mammal bycatch" is estimated to destroy "several hundred thousand animals per year, [and is] the primary threat to several endangered species of marine mammals."[35] Birds are common bycatch

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[27] *Id.*

[28] *Id.*

[29] Lawlor, *supra* note 17, at 12.

[30] Atlantic Bluefin, *supra* note 26.

[31] Brian R. MacKenzie, Henrik Mosegaard, & Andrew A. Rosenberg, *Impending Collapse of Bluefin Tuna in the Northeast Atlantic and Mediterranean*, 2 CONSERVATION LETTERS 25 (2009).

[32] *Bluefin Tuna Opens 2013 with Record Auction Price at Tsukiji: 1.78 Million Dollars*, MERCOPRESS: SOUTH ATLANTIC NEWS AGENCY, January 12, 2013, http://en.mercopress.com/2013/01/12/bluefin-tuna-opens-2013-with-record-auction-price-at-tsukiji-1.78-million-dollars.

[33] *Global Fisheries*, SEAWEB: LEADING VOICES FOR A HEALTHY OCEAN, http://www.seaweb.org/resources/briefings/fishery.php (last visited June 13, 2016).

[34] Erik Stockstad, *Global Loss of Biodiversity Harming Ocean Bounty*, 314 SCIENCE 745 (2006).

[35] Andrew J. Read, Phebe Drinker, & Simon Northridge, *Bycatch of Marine Mammals in U.S. and Global Fisheries*," 20 CONSERVATION BIOLOGY 163, 168 (2006).

victims. When hunting, they grab fishing lures, often swallowing longline hooks that pull them under the water. Nearly half of the earth's endangered seabirds are threatened by commercial fishing, destroying 300,000 seabirds annually, including individuals from 22 endangered species.[36] Because they are drowned, injured, and stressed, bycatch mortality rates are 90–100 percent.[37]

Bycatch also slows or prevents recovery of heavily fished populations and endangers otherwise healthy populations. In the Potomac River, for example, heavily trawled river herring have failed to recover. It is likely that "more river herring [are] caught as bycatch in ocean fisheries" that are targeting "species such as Atlantic herring, squid and mackerel" than the 1 million pounds caught annually in the few remaining fisheries" for river herring.[38] Roundnose and onion-eye grenadiers, once commercially fished, are also now taken almost entirely as bycatch.[39] Overfished between 1978 and 1994, we destroyed 87–98 percent of these fishes. Between 1995 and 2004, numbers of onion-eye grenadiers declined even more, dropping by more than 93 percent, while roundnose grenadiers dropped "an astonishing 99.6%."[40] All five species are likely to continue to decline because, thanks to bycatch, few are able to mature and breed.[41]

Shrimp nets are the worst bycatch offenders. The Food and Agriculture Organization (FAO) of the United Nations estimates that any given shrimp haul anywhere in the world carries 85 percent bycatch:[42]

> Shrimp fishing amounts to only 2 percent of the global wild seafood catch, but is responsible for 30 percent of all the bycatch in the world's fisheries. In some tropical shrimp fisheries, the bycatch is fifteen times the quantity of the shrimp caught. Thailand, the largest source of imported U.S. shrimp, is one of the worst offenders, with a bycatch ratio of 14:1.[43]

Shrimp fishing also has a severe impact on sea turtles, destroying more endangered turtles than all other human causes combined.[44]

Although it is conventionally viewed as "trash," bycatch is now profitable. This "unwanted" catch can be sold to factory fish farms and other low-grade markets—including feed for cattle, pigs, and chickens—which means that commercial fishers have even less incentive to reduce bycatch, especially if methods designed to reduce bycatch reduce overall catch.[45]

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[36] *Seabirds Needn't Die in Vain*, 195 NEW SCIENTIST 6 (2007); *Long Line Fact Sheet*, SEA TURTLE RESTORATION PROJECT (February 21, 2009), http://www.seaturtles.org/downloads/longline_factsheet.pdf.

[37] Ivor Clucas, *A Study of the Options for Utilization of Bycatch and Discards from Marine Capture Fisheries*, FOOD & AGRIC. ORG. OF THE UNITED NATIONS, http://www.fao.org/docrep/w6602e/w6602e00.htm (last visited June 13, 2016).

[38] Karl Blankenship, *Scientists Suspect Decline of Herring if Result of Bycatch in Other Fisheries: Fish Managers Considering Stepped-Up Monitoring and Closing Areas to Trawlers*, BAY J., July 1, 2010, http://www.bayjournal.com/article/scientists_suspect_decline_of_herring_is_result_of_bycatch_in_other_fisheri.

[39] *Researchers Say Deep Sea Fish Face Extinction*, THE GUARDIAN, January 6, 2006 [hereinafter *Researchers*], http://www.taipeitimes.com/News/world/archives/2006/01/06/2003287687; MacKenzie *supra* note 10.

[40] MacKenzie, *supra* note 10.

[41] *Researchers, supra* note 39; MacKenzie, *supra* note 9.

[42] Clucas, *supra* note 37.

[43] PETER SINGER & JAMES MASON, THE WAY WE EAT: WHY OUR FOOD CHOICES MATTER, 126 (2006).

[44] COMMITTEE ON SEA TURTLE CONSERVATION, ET AL., DECLINE OF THE SEA TURTLES: CAUSES AND PREVENTION 74–116 (1990), http://www.nap.edu/openbook.php?record_id=1536&page=74.

[45] Clucas, *supra* note 37.

2.2. Nets

Nets, including trawl nets, drift nets, gillnets, and seine nets, are the most common fishing method. The principles of net fishing are simple: sea life swims or is swept or scooped into a net, where it is trapped and pulled from the water.

Trawlers that scrape the ocean floor are the most environmentally damaging.[46] On the East Coast of North America, industrial mid-water trawlers are "the largest fishing vessels [at work and are] capable of netting 500,000 pounds of sea life in one tow." [47]

> The herring industry is becoming increasingly dominated by high-volume industrial ships known as midwater trawlers—which drag massive small-mesh nets behind them, catching everything in their path. The trawlers sometimes work in pairs so they can drag even bigger nets between them. The practice can lead to localized depletion of herring and contribute to the overfishing and stalled recovery of severely depleted populations of cod, hake, haddock, and other fish that live near the ocean floor.[48]

Numbers of large sharks, skates, and finfishes suffered a 60 percent decline just five years after the onset of industrial-scale trawling in the Gulf of Thailand.[49]

Like hooks, nets are indiscriminate and catch an abundance of bycatch, including endangered species. Mammals drown when they dive and become entangled in underwater nets, including seals, whales, and dolphins. Some 6,000 cetaceans and pinnipeds, including seals and walruses, die in nets every year, particularly in gill nets.[50] Since they were introduced in the late 1950s, purse seine tuna nets are estimated to have killed six million.[51]

Gill nets have all but eliminated the vaquita, a porpoise endemic to the northern part of the Gulf of California and now the world's most endangered cetacean—only a few hundred individuals remain. Although marine reserves have been set aside to protect vaquitas and their essential habitat, they continue to turn up in fishing nets, perhaps as many as 20–30 each year, obviously an alarming loss for such a small remnant population.[52]

Drift nets float free in the ocean, vertically, to a depth of 26 or 34 feet (8–10 m), with weights on the bottom and floats on top.[53] They can be anywhere from 10–40 miles (16–64 km) in length, and in the North Pacific there can be as many as 1,800 ships rolling out 28,000–35,000 miles (45–56 km) of net at any one time.[54] Whales and dolphins, seals and sea lions, sea turtles, and sea birds are routinely entangled

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[46] Rogers, *supra* note 1, at 41.

[47] Herring Alliance, *Bycatch and Monitoring*, http://www.pewtrusts.org/~/media/assets/2010/09/10/bycatch_monitoring.pdf (last visited June 10, 2016).

[48] *Under Pressure: Government Moves to Protect Herring*, IN BRIEF at 7 (Winter 2007–2008).

[49] Myers, supra note 4, at 281.

[50] Andrew J. Read, *Bycatch of Marine Mammals in U.S. and Global Fisheries*, 20 CONSERVATION BIOLOGY 163, 163 (February 2006).

[51] NOAA Fisheries, *The Tuna-Dolphin Issue*, https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=228&id=1408#Top (updated March 29, 2016).

[52] Rex Dalton, *Net Losses Pose Extinction Risk for Porpoise*, 429 NATURE 590 (2004); Gerardo Rodríguez-Quiroz et al., *Fisheries and Biodiversity in the Upper Gulf of California, Mexico*, in OCEANOGRAPHY 281, 291 (Marco Marcelli ed., 2012).

[53] Paul Watson, *Tora, Tora, Tora!, in* ENVIRONMENTAL ETHICS: WHAT REALLY MATTERS, WHAT REALLY WORKS 639, 641 (2012).

[54] *Id.*

in these nylon nets.[55] Because they are made of nylon, when lost at sea, these nets become "ghost nets," ensnaring and killing sea creatures as they float the ocean for decades.[56] One estimate is that mega-fleets of drift net fishers "lose an average of six miles of net" every day.[57]

2.3. Hooks

Droplines and longlines, both common commercial fishing methods, consist of a long line, which sometimes extends beyond 50 miles (80 km), "strung with smaller lines of baited hooks, which dangle at spaced intervals."[58] About five million longline hooks are dropped in the ocean every day, dangling an estimated one billion razor-sharp hooks annually.[59] Longlines are intended to catch large predator fishes, such as tunas and swordfishes, but are, like other widespread fishing methods, indiscriminate.[60] Each year, longlines pull in an estimated 4.4 million seabirds, marine mammals, sharks, billfishes, and sea turtles as bycatch.[61] Cetaceans are common longline hook victims, including pilot whales, false killer whales, Risso's dolphins,[62] and pseudorcas—an endangered cousin of the orca that lives in and around the Hawaiian Islands.[63] Blue and white marlins (billfishes), "identified as overfished," are among the frequent victims.[64] "Longline fisheries are [also] considered a critical threat to albatrosses and large petrels."[65] As with hooks, incidental catch rarely survives.[66] If turtles, for example, do not drown on longlines, then the physiological stress of being hooked is likely to affect their "ability to feed, swim, avoid predators, and reproduce."[67]

3. Moral theories

The development of Greek-rooted moral theories began in ancient Greece and continues in philosophical circles today. In this long-standing, well-defined moral tradition, theories are established and defended through the application of reason, consistency, and impartiality. Given that the fishing industry currently poses a

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[55] *Id.*

[56] *Id.* at 643.

[57] *Id.*

[58] MONTEREY BAY AQUARIUM, LONGLINING: FISHING METHODS FACT CARD, http://www.montereybayaquarium.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_Longlining&PurseSeiningFactCards.pdf (last accessed June 11, 2016).

[59] *Long Line Fact Sheet*, SEA TURTLE RESTORATION NETWORK (March 2003), http://www.seaturtles.org/downloads/longline_factsheet.pdf.

[60] Robert Ovetz, *Pillaging the Pacific: Pelagic Longline Fishing Captures and Kills About 4.4 Million Sharks, Billfish, Seabirds, Sea Turtles, and Marine Mammals Each Year in the Pacific Ocean*, SEA TURTLE RESTORATION PROJECT (2004).

[61] *Id.*

[62] J. W. Watson & D. W. Kerstetter, *Palegic Longline Fishing Gear: A Brief History and Review of Search Efforts to Improve Selectivity*, 40 MARINE TECHNOLOGY SOC. J. 6, 9 (Fall 2006).

[63] *False Killer Whale (Pseudorca crassidens)*, NOAA FISHERIES: OFFICE OF PROTECTED RESOURCES, http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/falsekillerwhale.htm (last visited June 11, 2016).

[64] Watson & Kerstetter, *supra* note 62.

[65] *Id.*

[66] *Gulf Sea Turtles Get a Breather: Government Orders Review of Long-Line Fishing*, IN BRIEF 11, 11 (Summer 2009).

[67] *Id.*

severe risk to sea life and marine ecosystems, what do moral theories indicate that we ought to do—as moral agents—with regard to this problem?

3.1. Utilitarian ethics

Utilitarians assess the best course of action based on likely outcomes.[68] Weighing likely benefits and harms, utilitarians seek to maximize benefits, pursuing the greatest good for the greatest number among those who will be affected by the chosen course of action.[69] "Good" can be measured in various ways. For example, some utilitarians might seek to bring about the greatest happiness as their measure of good, or they might seek to satisfy the greatest number of interests.[70]

To their credit, early utilitarians included nonhuman animals in their moral framework.[71] Jeremy Bentham, an early and important utilitarian philosopher, argued that utilitarian calculations needed to take the happiness or interests of nonhuman animals into account—all those effected must be taken into account equally, and all sentient beings can suffer or feel happiness depending on what happens to them.[72] As Peter Singer emphasizes, consistent utilitarian ethics weigh the concerns of all who are affected by a given action, and "take no account of whose interests they are weighing."[73] In other words, the interests of individuals from other species, whether salmon or seals, must be weighed equally with comparable human interests, including any interest in liberty and any interest in avoiding bodily harm. Further, utilitarian ethics hold that the interests of future generations must be taken into account. Thus those who are alive today ought to protect and maintain sentient living beings not only for the sakes of those sentient living beings but also on behalf of future human generations—once a species is lost, it is lost forever. Presumably, future generations would prefer to live in a world rich with diversity rather than on a planet stripped of key species.

The consistent application of utilitarian moral theory thereby dictates that those of us who have a choice in what we consume—those of us who are comparatively wealthy and who live in developed nations—ought not to consume fishes, both because sea creatures can suffer and prefer to live, and because of the grave environmental impact of contemporary fishing on fishes and ecosystems.

3.2. Rule-based ethics

Deontological or rule-based moral theories seek the best course of action via established rules. Rule-based ethics, exemplified by Immanuel Kant, hold that moral rules require mandatory observance by all moral agents (competent adults) in every

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[68] PETER SINGER, PRACTICAL ETHICS 3 (1979).
[69] JAMES RACHELS, THE ELEMENTS OF MORAL PHILOSOPHY 99 (8th ed. 2015).
[70] *Id.* at 100, 113.
[71] *See, e.g.*, JEREMY BENTHAM, INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION (T. Payne ed.) (1789).
[72] *Id.* ch. XVIII, sec. 1.
[73] SINGER, *supra* note 68, at 19 (emphasis added).

circumstance as a matter of duty.[74] Familiar moral rules, some of which are also incorporated into law, include "Do not lie," "Do not steal," and "Do not murder."[75] Such moral rules are universal because they allow people to trust one another and to live safely together in a community.[76]

Kant's categorical imperative indicates that we ought to choose a course of action that we would be willing to accept as a universal law.[77] If, for example, I find an orphaned child, and I am wondering what course of action I ought to take, I would turn the various possibilities into universal laws: All passersby ought to walk away from orphaned dependents, leaving them on their own; all passersby ought to assist orphaned dependents, or find someone who is better suited to do so.

Human rights are a list of moral rules that protect the most basic interests of human beings. We are obligated to honor these rules as a matter of duty: Do not murder, do not imprison, do not rape, do not enslave, and so on.[78] Renowned contemporary philosopher Tom Regan noted that humans need these moral protections because of the types of beings that we are—because what happens to us matters to us, and because we fare better or worse depending on what happens to us.[79] For example, being wrongly imprisoned makes our lives sad and lonely, and being tortured fills our lives with fear and misery. Consistency and impartiality are critical, and Regan noted that nonhuman animals also have well-being or welfare such that it also matters what happens to them: They fare better or worse according to how they are treated.[80] They also suffer if they are imprisoned and if someone causes then to experience severe pain.[81] While a rock does not fare better or worse if you offer shelter and sustenance, both a child and a catfish do.

Because we exploit nonhuman animals in various ways, including our tendency to eat them, "it is really important [morally speaking] to understand the consequences of our actions for those animals."[82] To be consistent, as the philosophical process requires, we ought to protect the basic rights of all beings for whom such protections (against wounding or killing, for example) matter. This is why Regan argued that fundamental human rights—rights that have to do with basic welfare—ought to be extended to nonhumans who care what happens to them—nonhumans who are conscious and sentient.[83]

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[74] RACHELS, *supra* note 69, at 129–30.
[75] *Id.* at 25.
[76] *Id.*
[77] *Id.* at 130.
[78] *Deontological Ethics: 2.2 Patient-Centered Deontological Theories*, STANFORD ENCYCLOPEDIA OF PHIL. (2012), http://plato.stanford.edu/entries/ethics-deontological/.
[79] TOM REGAN, EMPTY CAGES: FACING THE CHALLENGE OF ANIMAL RIGHTS 50 (2004) [hereinafter REGAN, EMPTY CAGES].
[80] *See* RACHELS, *supra* note 69a, at 135; *see also* TOM REGAN, THE CASE FOR ANIMAL RIGHTS 82 (1983) [hereinafter REGAN, CASE FOR ANIMAL RIGHTS].
[81] *Id.*
[82] Harvey Black, *Underwater Suffering: Do Fish Feel Pain?: A Study Suggests Fish Consciously Experience Discomfort*, SCI. AM. (September 17, 2009), http://www.scientificamerican.com/article.cfm?id=underwater-suffering-do-fish-feel-pain.
[83] REGAN, CASE FOR ANIMAL RIGHTS, *supra* note 80, at 190, 240; REGAN, EMPTY CAGES, *supra* note 79, at 59–60.

4. Who are fishes?

In the Western philosophical tradition, utilitarian and deontological moral theories are the two strongest bases for determining a morally preferred course of action. As it turns out, being morally considerable in each theory rests on the nature of the beings in question—are they sentient and/or conscious? Are fishes the types of beings who ought to be protected by basic rights?

In fact, fishes can and do suffer from "pain, fear and stress."[84] They are vertebrates with a complex nervous system.[85] Anatomical, pharmacological, and behavioral data, as well as evolutionary evidence and neurophysiological analogies, suggest that fishes suffer.[86] It is "unthinkable that fish do not have pain receptors; they need them in order to survive."[87] Fishes have nerve endings designed to register pain, just like other vertebrates, and fishes produce the same brain chemicals that humans produce to counter pain: enkephalins and endorphins.[88] Their responses to pain can be complex. Goldfishes, for example, respond to pain "consciously, rather than simply reacting with a reflex."[89] When subjected to pain, they behave fearfully, exhibiting "avoidance behavior," which "is cognitive—not reflexive."[90] They also become upset when handled roughly, for example—following such an encounter, their hormone levels do not readjust for 48 hours.[91] Similarly,

> when noxious substances were applied to the lips of trout, the fishes' heart rates increased, and they took longer to resume feeding. These fish also exhibited unusual behaviors after being harmed, including rocking from side to side while balanced on their pectoral fins, and rubbing their lips into the gravel and against the tank walls. Treatment with a pain suppressant significantly lowered these effects. Other experiments have found that fish learn to avoid unpleasant stimuli such as electric shocks, and piercing of their lips by sharp hooks.[92]

Fishes' brains are much more complex than most people are likely to assume. For example, they can navigate complex mazes.[93] They have strong memories such that they purposefully avoid areas where they have been threatened, and they show clear signs of fear when approaching areas where they remember having been previously frightened or harmed.[94] They also use long-term memories to survive in waters riddled with predators and to navigate a complex social world.[95] They can recognize

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[84] K.P. Chandroo, I.J.H. Duncan, & R.P Moccia, *Can Fish Suffer?: Perspectives on Sentience, Pain, Fear and Stress*, 86 APPLIED ANIMAL BEHAV. SCI. 225–250 (2004).
[85] *Id.*
[86] *Id.*
[87] Voices for Animals, *The Problem with Fishing: Fish and Pain*, PITTSBURGH INDEP. MEDIA CENTER (July 27, 2005), http://pittsburgh.indymedia.org/news/2005/07/19545_comment.php.
[88] Black, *supra* note 80, at 187.
[89] *Id.*
[90] *Id.*
[91] JONATHAN BALCOMBE, PLEASURABLE KINGDOM 186–187 (2006).
[92] *Id.* at 20–21.
[93] Rodríguez-Quiroz et al., *supra* note 52.
[94] *Id.*
[95] BALCOMBE, *supra* note 91, at 188.

"shoal mates," acknowledge hierarchy, track relationships, and eavesdrop on others in their community.[96]

Fishes' brains, like those of other vertebrates, help fish avoid suffering, and this requires a good memory and the ability to learn.[97] Fish are intelligent enough to use tools,[98] which is extraordinary given their anatomy. In Australia's Great Barrier Reef, a blackspot tuskfish was filmed using his mouth to grasp and strike a clam on a rock to access the flesh inside.[99] In Palau, in Micronesia, an orange dotted tuskfish was filmed digging clams, toting them to rocks, then tossing them against the hard surface: "impressive when you consider that fish don't have hands."[100] Such observations have radically altered our scientific understanding of fishes, and it is time to shed the image of fish as drudging and dim-witted pea brains, driven largely by "instinct," with what little behavioral flexibility they possess being severely hampered by an infamous "three-second memory." Evidence indicates that fish are steeped in social intelligence, pursuing Machiavellian strategies of manipulation, punishment, and reconciliation, exhibiting stable cultural traditions, and cooperating to inspect predators and to catch food.[101]

Fish "are sensitive to pain, have memory and are capable of learning, and are conscious" of their existence.[102] Most notably, fishes have a central nervous system, which means they can and do suffer—and suffering is always morally relevant. Like chickens, cattle, and human beings, "fish are conscious of their existence" and they fare better or worse depending on how we treat them.[103] Fish, it turns out, are much more like other animals (humans included) than we supposed. Like "amphibians, reptiles, birds, mammals, and humans," fishes "have all the relevant characteristics attributable to animals requiring humane treatment."[104]

5. Possible solutions

Give the types of beings that fishes are, it is remarkable how little concern people tend to show for their suffering and dying. While increasingly common to show concern for other nonhuman animals exploited for food, such as cows and hens and sows, fishes are often overlooked. Perhaps this is because fishes lack the attributes that seem to more readily spark human empathy—fur, warm bodies, and eyes similar to our own. And fishes are immersed in water, where humans visit only temporarily, often viewing fish through glass contraptions. Likely this particular set of circumstances helps to create a situation in which humans lack empathy for fishes. But given

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[96] *Id.*

[97] Dionys de Leeuw, *Contemplating the Interests of Fish: The Angler's Challenge*, 18 ENVTL. ETHICS 373, 378 (1996).

[98] Balcombe, *supra* note 91, at 188.

[99] Mark Brown, *Fish Photographed Using Tools to Eat*, WIRED.COM (November 24, 2013), http://www.wired.com/wiredscience/2011/07/fish-tool-use.

[100] Jennifer Viegas, *Video Shows Fish Using Tools*, SEEKER.COM (September 29, 2011), http://www.seeker.com/video-shows-fish-using-tools-1765450892.html#news.discovery.com.

[101] Keven N. Laland et al., *Learning in Fishes: From Three-Second Memory to Culture*, 4 FISH AND FISHERIES 199 (2003).

[102] de Leeuw, *supra* note 97, at 325.

[103] *Id.* at 378.

[104] *Id.* at 325, 289.

who fishes are, ethics indicate that we need to take them into consideration—that they are morally considerable. What do ethics indicate as the best course of action?

5.1. Aquaculture—factory fisheries

In response to concerns about diminished and endangered populations, aquaculture is sometimes advocated as a method of securing fish without further pressuring free-ranging fish populations. Farming fishes, like farming land animals, is much more like a factory than a traditional farm, and the effects of factory fisheries on wild fishes and the environment are far from benign.

Carnivorous fishes such as salmon, when raised in factory-fishing operations, must be fed other fishes. Therefore, factory fisheries exploit bycatch and other wild-caught populations, such as "milkfish in the Philippines and Indonesia, tuna in South Australia, shrimp in South Asia and parts of Latin America, and eels in Europe and Japan" in order to feed carnivorous captive fishes.[105] It takes about two and a half to three pounds of wild-caught fish, for example, to produce a pound of farmed salmon.[106] Thus factory fisheries, like factory farms, feed more pounds than they ultimately produce.

Stripping the oceans of life—often smaller fish and bycatch—to supply fish factories with feed for carnivorous fishes disrupts marine ecosystems, disproportionally affecting predators who depend on smaller species for sustenance. Off the coast of Peru, for example, there is a clear correlation between anchoveta numbers and the size of sea bird and marine mammal populations.[107] "The peruvian anchoveta is very popular for making fish meal and it produces one of the highest quality fish meals in the world."[108] Similarly, taking capelins, sandeels, and Norway pouts from the North Sea, "largely for production of fishmeal, has been linked to declines of other wild fishes, such as cod, and also to changes in the distribution, population sizes, and reproductive success of various seal and seabird colonies."[109]

Factory fisheries have other adverse environmental effects. "Hundreds of thousands of hectares of mangroves and coastal wetlands around the world have been transformed into milkfish and shrimp farms,"[110] which means that these vital ecosystems no longer fulfill their natural functions as "nursery habitat for juvenile fish and shellfish" or as ecological buffers against storms, flooding, and water pollution.[111] Again, shrimp factories are especially problematic environmentally: "If the full range of ecological effects associated with mangrove conversion is taken into account, including reduced mollusk productivity in mangroves and losses to

[105] Rosamond Naylor et al., *Effect of Aquaculture on World Fish Supplies*, 8 ISSUES IN ECOLOGY 1, 6 (2001).
[106] KAREN DAWN, THANKING THE MONKEY 158 (William Morrow ed., 2008); Daniel Pauly & Reg Watson, *Counting the Last Fish*, 289 SCI. AM. 42, 45 (2003).
[107] Naylor et al., *supra* note 105, at 7.
[108] *Peruvian Anchoveta*, GREENFACTS: FACTS ON HEALTH AND THE ENVIRONMENT, http://www.greenfacts.org/glossary/pqrs/peruvian-anchoveta.htm (last visited April 28, 2016).
[109] Naylor et al., *supra* note 105, at 7.
[110] *Id.* at 6.
[111] *Id.*

seagrass beds and coral reefs, the net yield from these shrimp farms is low—even without considering the use of fish meal."[112]

It is also problematic that factory fisheries are typically separated from surrounding ocean ecosystems only by nets. This means that when fish escape, an additional set of problems arise. Atlantic salmon—the dominant salmon species farmed worldwide—frequently escape from net pens. In some areas of the North Atlantic Ocean, as much as 40 percent of Atlantic salmon caught by fishermen is of farmed origin. In the North Pacific Ocean, more than a quarter million Atlantic salmon have reportedly escaped since the early 1980s, and Atlantic salmon are regularly caught by fishing vessels from Washington to Alaska (in the Pacific Ocean). Increasing evidence suggests that farm escapees may hybridize with and alter the genetic makeup of wild populations of Atlantic salmon, which are genetically adapted to their natal spawning grounds. This type of genetic pollution could exacerbate the decline in many locally endangered populations of wild Atlantic salmon. In the Pacific Northwest, there is evidence that escaped Atlantic salmon now breed in some streams, perhaps competing for spawning sites with beleaguered wild Pacific salmon.[113]

Additionally, unnaturally crowded conditions in fish factories make it more likely that these fishes will carry parasites and diseases.[114] While factory fishes are treated with chemicals and antibiotics, much as factory farmers treat cattle, hogs, and poultry with chemicals and antibiotics to adjust for unnaturally crowded conditions, free-ranging native salmon receive no such protection. For example, there is a direct connection between the aquaculture industry's rapid growth in the Broughton Archipelago off British Columbia and the sharp decline in its wild pink salmon due to an infestation of open-net salmon pens by sea lice. Though older salmon can handle the parasite, young wild salmon migrating through these areas are much more vulnerable. "In the natural system, the youngest salmon are not exposed to sea lice because the adult salmon that carry the parasite are offshore .... Fish farms cause a deadly collision between the vulnerable young salmon and sea lice. They are not equipped to survive this, and they don't."[115]

In crowded factory fisheries, diseases are not easily controlled, and factory fishing spreads diseases across populations and continents. Until recently, only factories raising shrimps in Asia suffered from white spot and yellow-head viruses. White spot generally kills 100 percent of farmed shrimps affected within three to ten days, while yellow-head does so in three to five days.[116] But these diseases have now spread across North, Central, and South America, most likely introduced to Texas via factory shrimps and/or by shipping "contaminated white shrimp larvae throughout the Americas."[117]

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[112] *Id.*

[113] *Id.* at 7.

[114] Andrew A. Rosenberg, *Aquaculture: The Price of Lice*, 451 NATURE 23, 24 (2008).

[115] *Salmon Farming Threatens Wild Populations*, 57 AWI QUARTERLY 18 (2008) (quoting Alexandra Morton, director of Salmon Coast Field Station).

[116] Reddy et al., *Effect of Processing Treatments on the White Spot Syndrome Virus DNA in Farmed Shrimps (Penaeusmonodon)*, 52 LETTERS IN APPLIED MICROBIOLOGY 393 (2011).

[117] Naylor et al., *supra* note 105, at 8.

Yet another environmental concern inherent in factory fisheries is pollution caused to the larger sea ecosystems. Fish food and waste, chemicals, hormones, and antibiotics produced by factory fisheries contaminate surrounding marine ecosystems.[118] Food pellets, for instance, create "about as many emissions of nitrogen and phosphorus as the poultry industry."[119] Surrounding waters are also contaminated by toxic levels of ammonia and nitrite, which drop under and float around fish pens and cages, interfering with nutrient cycling in seabed communities.[120] The pollutants of factory fishing compound the problems caused by factory farming, which have already created more than 400 dead zones in the past 50 years,[121] destroying 27,027 square miles (70,000 km^2) in the Baltic Sea and 8,000 square miles (20,700 km^2) in the Gulf of Mexico.[122]

Finally, factory fisheries bring death to native carnivores who are attracted to large concentrations of fishes. When ospreys, herons, sharks, seals, bears, minks, otters, or raccoons are attracted to factory fisheries, they threaten profits and become targets for government predator control programs, further disrupting ecosystems.[123]

5.2. "Sustainable" fisheries

Faced with the moral concerns raised by eating fishes, both for fishes themselves and for the environment, some consumers have tried to switch to the consumption of "sustainable" fishes. Unfortunately, the "sustainable" label has proven less than dependable. It is a common industry practice to substitute "one seafood species for another," both in the United States and in other countries, "at levels ranging from 25 to more than 70 percent for commonly swapped species such as red snapper, wild salmon and Atlantic cod."[124]

From 2010 to 2012, Oceana conducted one of the largest seafood fraud investigations in the world to date, collecting more than 1,200 seafood samples from 674 retail outlets in 21 states to determine if they were honestly labeled. DNA testing found that one-third (33 percent) of the 1,215 samples analyzed nationwide were mislabeled.[125]

The same study found that snapper was mislabeled 87 percent of the time, and tuna 59 percent of the time. With regard to red snappers specifically, only seven of 120 samples nationwide "were actually red snapper"—the remaining 113 samples

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[118] Marianne Cufone, *Ocean Fish Farms and Public-Resource Privatization*, 19(12) THE AMERICAN PROSPECT A17 (2008).
[119] Mark Hawthorne, *Planet in Peril*, VEGNEWS, March–April 2012, at 38.
[120] Naylor et al., *supra* note 105, at 8.
[121] David Perlman, *Scientists Alarmed by Ocean Dead-Zone Growth*, SFGATE, August 15, 2008, http://www.sfgate.com/green/article/Scientists-alarmed-by-ocean-dead-zone-growth-3200041.php.
[122] Henning Steinfeld et al., *Livestock's Long Shadow: Environmental Issues and Options*, FOOD AND AGRIC. ORG. OF THE UNITED NATIONS 212 (2006).
[123] KEMMERER, *supra* note 2, at 33–35.
[124] Kimberly Warner et al., *Oceana Study Reveals Seafood Fraud Nationwide*, OCEANA (February 2013), http://www.scribd.com/doc/128051836/National-Seafood-Fraud-Testing-Results-FINAL.
[125] *Id.*

were "some other species of fish."[126] Sushi venues tended to sell mislabeled fishes most often (74%), "followed by restaurants (38%) and grocery stores (18%)."[127]

The study also found that

> seafood substitutions included species carrying health advisories (e.g. king mackerel sold as grouper; escolar sold as white tuna), cheaper farmed fish sold as wild (e.g. tilapia sold as red snapper), and overfished, imperiled or vulnerable species sold as more sustainable catch (e.g. Atlantic halibut sold as Pacific halibut) ... [T]esting also turned up species not included among the more than 1,700 seafood species the federal government recognizes as sold or likely to be sold in the U.S.[128]

This study casts a very doubtful shadow on the moral efficacy of purchasing fishes that are labeled as "sustainable," indicating that moral agents ought to simply avoid consuming fishes if they are concerned about fish populations—or about the lives and sufferings of sea life.

5.3. Marine reserves

Neither consuming fish reared on factory fish farms nor consuming fishes labeled as "sustainable" offers a morally sound alternative to eating fishes acquired through conventional industrial fishing methods. Morality points to a diet free of fishes. Even so, there is much work to be done if we are to restore fish populations and marine ecosystems.

The creation of marine parks/reserves is an important step towards protecting large, slow-growing fishes and fragile ecosystems. These areas will need to be closed to fishing and protected by law enforcement. To do this will require moral commitment backed by economic investment—most notably we will need park rangers and law enforcement. Some nations are already creating and managing some much needed marine reserves. In 2015 the British created the largest single marine reserve in the world, Pitcairn Islands Marine Reserve, "larger than the state of California," where "No fishing or seafloor mining will be allowed ... except for traditional fishing around the island of Pitcairn by the local population."[129] In 2010 the British created the then-largest Chagos Marine Protected Area in the central Indian Ocean, "a fully no-take marine protected area."[130]

It makes more economic sense to pay fishers to tend and to police marine reserves than it does to pay them compensatory money—somewhere between 15 and 30 billion dollars a year—because they are out of work due to fishery closures and harvesting restrictions.[131] Furthermore, such investment would align with the dire environmental need to preserve ocean ecosystems and our scientific understanding

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[126] *Id.*
[127] *Id.*
[128] *Id.*
[129] Brian Clark Howard, *World's Largest Single Marine Reserve Created in Pacific*, NATIONAL GEOGRAPHIC (March 18, 2015), http://news.nationalgeographic.com/2015/03/150318-pitcairn-marine-reserve-protected-area-ocean-conservation/.
[130] *Welcome to the Chagos Conservation Trust*, CHAGOS CONSERVATION TRUST, http://chagos-trust.org/ (last visited April 29, 2016).
[131] Ben Harder, *Cost of Protecting the Ocean*, 165 SCIENCE NEWS 414 (2004).

of fishes as sentient and conscious. In other words, investing in permanent marine reserves is in line with what moral theories indicate we ought to do in order to bring about the greatest good for the greatest number—greatest number including both sea life and future human generations—and in order to protect the rights of fishes as conscious, sentient beings.

6. Conclusion

Studies indicate that certain marine species and ecosystems are in grave danger because of industrialized fishing—because of high and ever-increasing human demand for sea life as food and because the fishing methods used (hooks and nets) are inherently indiscriminate. Although we have augmented our "catch" with factory fisheries, these fish farms also have serious negative consequences for wild sea life and the environment. Complicating the moral equation, studies demonstrate that fish are sentient and capable of fairly complex thought processes: They are similar to other nonhuman animals in morally relevant ways, and we therefore ought not to treat them—their lives and their welfare—with such brazen indifference.

Our ongoing indifference to the sufferings and premature deaths of millions of fishes and the frightening disappearance of fish populations and consequent degradation of ocean ecosystems are likely rooted both in our taste for fishes (and our unwillingness to consider alternative foods) and in the reality of fishes as out of sight and therefore out of mind. When we gaze out across the sea, the light shines and dances on the surface of the ocean—nothing looks amiss: It is easy to assume that all is well in the deep blue and that we need not inquire about the health of our seas or about the individuality, complexity, and sufferings of sea life.

But this is certainly not the case. Ethics indicate that informed moral agents will need to change eating habits to avoid eating fishes and other sea life. More specifically, utilitarian ethics, which indicate that we ought to seek the greatest good for the greatest number (including the good of individual fishes and the good of future human beings), tell us that we ought not to eat fishes—or sea life more broadly. Additionally, deontological ethics indicate that fish, like other animals (including humans), are morally considerable—that the lives and welfare of sentient and conscious sea life must be taken into consideration when we decide what to put on our plates.

Sea life matters morally—what we eat matters morally. Both rule-based and utilitarian ethics indicate that, in light of ecological devastation and individual suffering, moral agents who can choose other food options ought to do so. Frankly, if moral agents stop eating fishes, we will not need marine parks—when those who have other options stop eating sea life, the oceans will once again become full and rich with diversity.